

Appln. No.: 10/634,607

AMENDMENTS TO THE CLAIMS:

1. (Previously Presented) An electrode for an electrochemical cell, comprising:
an electrode material including an active material having a proton-conducting compound and a nitrogen-containing heterocyclic compound;
wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives.

2. (Original) The cell electrode as claimed in Claim 1 wherein the electrode material comprises a nitrogen-containing heterocyclic compound and a polymer having a unit containing a nitrogen-containing heterocyclic moiety.

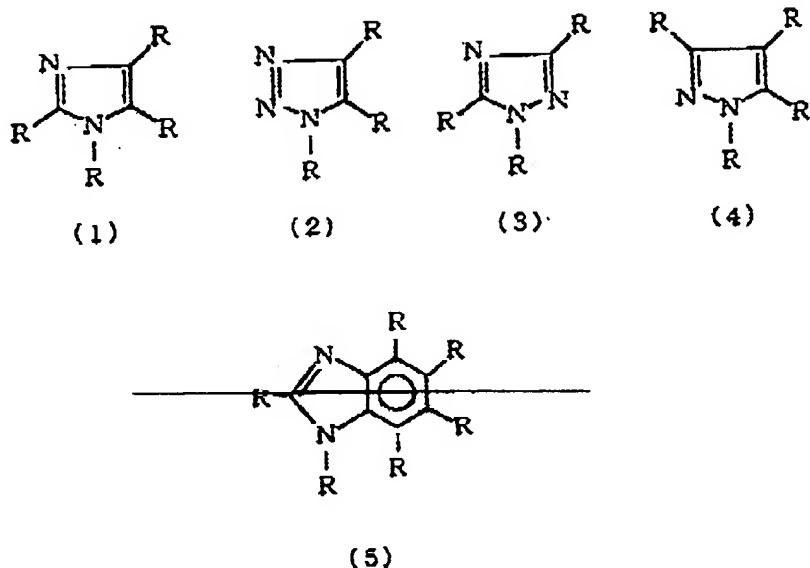
3. (Original) The cell electrode as claimed in Claim 1, used for an electrochemical cell wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

4. (Previously Presented) The cell electrode as claimed in Claim 1, wherein the nitrogen-containing heterocyclic compound further comprises one or both of benzimidazole and its derivatives.

5. (Previously Presented) The cell electrode as claimed in Claim 1, wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole or its derivative represented by formula (1), triazole or its

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derivative represented by formula (2) or (3), and pyrazole or its derivative represented by formula (4):

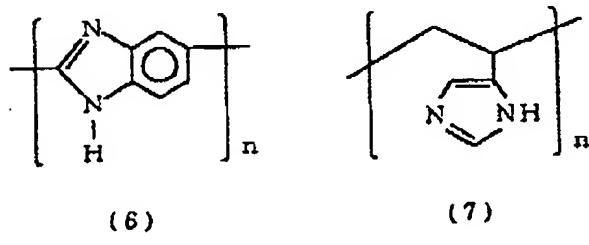


wherein R independently represent hydrogen, alkyl having 1 to 4 carbon atoms, amino, carboxyl, nitro, phenyl, vinyl, halogen, acyl, cyano, trifluoromethyl, alkylsulfonyl or trifluoromethylthio.

6. (Withdrawn) The cell electrode as claimed in claim 1 comprising a polymer containing a benzimidazole moiety, benzobisimidazole moiety or imidazole moiety as the polymer.

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7. (Withdrawn) The cell electrode as claimed in Claim 1 comprising polybenzimidazole represented by formula (6) or polyvinylimidazole represented by formula (7) as the polymer:



wherein n represents a positive integer.

8. (Original) The cell electrode as claimed in Claim 1 comprising 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound to 100 parts by weight of the active material.

9. (Withdrawn) The cell electrode as claimed in Claim 1 comprising 1 to 80 parts by weight of the polymer to 100 parts by weight of the active material.

10. (Original) The cell electrode as claimed in Claim 2 comprising 1 to 80 parts by weight of the nitrogen-containing heterocyclic compound and the polymer to 100 parts by weight of the active material.

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11. (Original) An electrochemical cell wherein at least one of the electrodes is the electrode as claimed in Claim 1 and both electrodes comprise a proton-conducting compound as an active material.

12. (Original) An electrochemical cell as claimed in Claim 11 comprising an electrolyte containing a proton source wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

13. (Original) A secondary battery comprising the electrochemical cell as claimed in Claim 11.

14. (Withdrawn) A capacitor comprising the electrochemical cell as claimed in Claim 11.

15. (Currently Amended) An electrochemical cell, comprising:
~~a [[an]] positive electrode material including an active material having a proton-conducting compound and one of a nitrogen-containing heterocyclic compound or a polymer having a unit containing a nitrogen-containing heterocyclic moiety, the positive electrode being formed on a positive current collector;~~
a negative electrode; and
a separator separating the positive electrode and the negative electrode;

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wherein the active material in the electrode material forms a positive current collector, the positive current collector separated from a negative electrode by a separator, the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives.

16. (Currently Amended) An electrochemical cell, comprising:

an electrode material including an active material having a proton-conducting compound and ~~one~~ of a nitrogen-containing heterocyclic compound or a polymer having a unit containing a nitrogen-containing heterocyclic moiety,

wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge, [[and]]

wherein the electrochemical cell comprises an electrolyte containing a proton source, and wherein only adsorption and desorption of protons in the electrode active material is involved in electron transfer in a redox reaction in both electrodes associated with charge and discharge; and

wherein the nitrogen-containing heterocyclic compound is one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives.

17. (Previously Presented) An electrochemical cell wherein at least one of the electrodes is the electrode as claimed in Claim 4 and both electrodes comprise a proton-conducting compound as an active material.

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18. (Previously Presented) The electrochemical cell as claimed in claim 17 comprising an electrolyte containing a proton source wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

19. (Previously Presented) A secondary battery comprising an electrochemical cell:

wherein at least two of the electrodes of the electrochemical cell comprise an electrode material including an active material having a proton-conducting compound;

wherein at least one of the electrodes of the electrochemical cell comprises an electrode material including a nitrogen-containing heterocyclic compound; and

wherein the nitrogen-containing heterocyclic compound comprises one or more compounds selected from the group consisting of imidazole, triazole, pyrazole, and their derivatives.

20. (Previously Presented) An electrochemical cell wherein at least one of the electrodes is the electrode as claimed in Claim 5 and both electrodes comprise a proton-conducting compound as an active material.

21. (Previously Presented) The electrochemical cell as claimed in Claim 20 comprising an electrolyte containing a proton source wherein only protons act as a charge carrier in a redox reaction in both electrodes associated with charge and discharge.

22. (Previously Presented) The electrochemical cell as claimed in Claim 20, wherein the electrochemical cell is arranged in a secondary battery.